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# THE TOBACCO AND SOLANUM WEEVILS OF THE GENUS TRICHOBARIS

By H. S. BARBER, *associate entomologist, Division of Insect Identification, Bureau  
of Entomology and Plant Quarantine*

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## ECOLOGICAL AND ECONOMIC BEARINGS OF STUDY

The studies herein recorded are the outgrowth of attempts to supply identifications of several forms of the weevil genus *Trichobaris* repeatedly submitted as injurious to tobacco, potato, eggplant, bel-ladonna, *Datura*, and other cultivated solanaceous plants. Such injuries are supposed to follow temporary transference of a local species from its normal breeding place in some wild solanaceous host plant, such as *Solanum*, *Physalis*, or *Datura*, to an adjacent more desirable but less resistant cultivated plant. The frequent transfer from weed to crop plant and vice versa appears to have been assumed rather than demonstrated (Somes, 14, p. 43).<sup>1 2</sup> It is conceivable, however, that certain strains of some species of these weevils easily adapt themselves to certain crop plants and seldom revert to the wild plants that are hosts to weevils indistinguishable from those damaging the crop. A better knowledge of the habits of the several species in uncultivated areas is a great desideratum and should be useful in connection with efforts to prevent their attacks as well as helpful in solving certain taxonomic problems. The genus *Trichobaris* seems to

<sup>1</sup>Italic numbers in parentheses refer to Literature Cited, p. 28.

<sup>2</sup>Somes' experiment in rearing the potato stalk borer (*Trichobaris trinotata*) from larvae which had been extracted from stems of horsenettle (*Solanum carolinense*) and introduced into stems of tomato is unique in the records of this genus.

be restricted to solanaceous host plants, but the accumulated records are clouded by many misidentifications.

The most important species attacking cultivated plants in the United States seems to be the tobacco stalk weevil, *Trichobaris mucorea* (Lec.), of the Southwest. This species (pl. 1) was first named from a single specimen from Yuma, Ariz., and appears to have spread eastward almost to Louisiana. Historical specimens are lacking to prove such movement, and it is equally likely that its original home, as in the case of the bollweevil of cotton, was northern Mexico from coast to coast, and that its invasion of our Southern States represents but a slight advance. Its subdivision into several species is not acceptable according to present information, and the names which have been proposed are here listed as synonyms or as indicating varieties, awaiting biological demonstration of the existence of distinct strains. Samples recently received from Mexico suggest, however, that tobacco in Chihuahua and tomato in Guerrero may be seriously attacked by one of the three species described herein as new.

Although numerous species of possible host plants are reported from tropical America, no species of *Trichobaris* is known from south of the Isthmus of Tehuantepec in Mexico. The introduction of any species of the genus into a new habitat should be regarded as very dangerous.

#### VARIATION AND THE DATA FROM SPECIMEN LABELS

The taxonomist often has no data to guide his interpretation of the abnormal individuals present among his specimens, and the writer believes that dwarf or giant individuals have become the types of several of the named "species" now composing the genus *Trichobaris*. The effect on these weevils of malnutrition from any cause is unknown. We can only guess that certain small individuals sometimes found among larger specimens are the result of subnormal assimilation; but as such individuals usually exhibit other differences in habitus and vestiture, their interpretation as distinct species, by some taxonomists, is to be expected. The writer believes that the type specimens for which the specific names *mucorea*, *plumbea*, *impotens*, *nanella*, *arida*, and perhaps *utensis*, were proposed may be such depauperate or abnormal individuals. On the other hand, he has no evidence that certain of these types do not represent the norm of a "phytophagic species" (15) or a local race to be distinguished on account of specialization to a host plant or because of past isolation.

Among the relatively few cases where a host plant is recorded on a label attached to a specimen, uncertainty usually remains as to whether the plant was the breeding place of the individual or its temporary resting or feeding place during travel or migration. The custom of attaching a host-plant label to only one specimen of a lot, with the inevitable subsequent mixing of the lots, has obscured many valuable records.

If a species is regarded as a population of individuals the physical differences of which may be due to development under different environmental and nutritional influences resulting from the instinctive or accidental choice by the female parent of places for egg deposition, then it should be obvious that the normal and abnormal behavior of



each species must be considered before the ultimate nomenclatorial synonymy can be indicated. Inadequate for this purpose as are the customarily used pin labels, the few that cite host plants suggest the following: (1) Two species of *Trichobaris* which are commonly stem borers in *Datura* also attack tobacco stems, *T. mucorea* (Lec.) in the Sonoran region of the United States and Mexico and *T. championi* (herein described as new) in eastern Mexico, the latter species also attacking tomato stalks in Guerrero as previously mentioned. (2) Another species, *T. trinotata* (Say), long known to attack potato in the Eastern States, also attacks eggplant and normally breeds in the stems of the species of *Physalis* and in *Solanum carolinense*. (3) In contrast with these stem-boring forms, there are species, related to *compacta* and to *soror*, which breed in the seed pods of *Datura* but, judging from incomplete data on specimens, may also attack cultivated solanaceous plants, two lots having been labeled as on potato.

#### TAXONOMIC PAPERS RELATING TO THE GENUS TRICHOBARIS; REFERENCES IN CATALOGS AND CHECK LISTS

Papers contributing to the taxonomic knowledge of the genus are not numerous. They are listed below in their chronological order, which governs the choice among available names.

- Say, 1831. Descriptions of New Species of Curculionides of North America . . . , p. 17; reprinted in LeConte edition of Say's Complete Writings, 1859, v. 1, p. 280 (*Baridius trinotatus*, new species, with *pensylvanica* valid as synonym).  
 Boheman, 1836. In Schoenherr, Genera et Species Curculionidum . . . , v. 3, p. 718 (*Baridius vestitus*, composite species, with *trinotatus* Say cited as synonym, and the former nomina nuda *tripunctatus* and *cinereus* validated as additional synonyms).  
 Boheman, 1844. In Schoenherr, Genera et Species Curculionidum . . . , v. 8 (pt. 1), pp. 160, 171 (*Baridius pellicæus*, new species, and *vestitus* female [according to Champion, 1909, an error, this being the female of *soror*]).  
 LeConte, 1858. Acad. Nat. Sci. Phila. Proc. 10: 79 (*Baridius mucoreus*, new species, compared with *trinotata*).  
 LeConte, 1868. Acad. Nat. Sci. Phila. Proc. 20: 364, 365 (*Baridius plumbeus*, new species, *trinotatus*, with *vestitus* cited as synonym, and *mucoreus*).  
 LeConte, 1876. Amer. Phil. Soc. Proc. 15: 287-288 (usually known as the LeConte and Horn Rhynchophora) (*Trichobaris*, new genus, *texana*, new species, *trinotata*, with *vestitus* cited as synonym, *mucoreus*, listed as variety of *trinotata*, and *plumbea*).  
 Casey, 1892. N. Y. Acad. Sci. Ann. 6: 561-568 (revision, synonyms, table, as well as detailed descriptions of 3 new species, *insolita*, *compacta*, and *cylindrica*).  
 Champion, 1909. Biologia Centrali-Americana. Insecta. Coleoptera, v. 4 (pt. 5), pp. 411-415 (table of 6 species, *vestita* (not *trinotata*), *mucorea*, *compacta*, *soror*, new species, *pellicea*, with *texana* cited as synonym, and *cylindrica*).  
 Blatchley and Leng, 1916. Rhynchophora or Weevils of North Eastern America, pp. 374-376 (only 2 species treated, *trinotata* and *insolita*. certain host-plant records, *Datura*, *Xanthium*, and tobacco, questionable).  
 Casey, 1920. Memoirs on the Coleoptera, v. 9, pp. 374-383 (comments on 7 old species and lengthy descriptions of 14 new species).

The catalogs and check lists reflecting these papers are listed below; but since the species names given in the catalogs by Melsheimer (1806) and Dejean (1833 and 1837) are invalid, these are not cited.

- Melsheimer, 1853 (1 species, *Baridius trinotata*, with *vestitus* cited as synonym).  
 Gemminger and Harold, 1871 (*Baridius* given as synonym of *Baris*, and the specific names then available, except *plumbeus*, which seems to have been omitted, cited as synonyms under *Baris mucorea*, *B. pellicea*, and *B. trinotata*).  
 Crotch, 1873 (3 species, *Baris plumbeus*, *B. trinotatus*, and *B. mucoreus*).  
 Austin, 1880 (3 species, *Trichobaris texana*, *T. trinotata*, and *T. plumbea*).

Henshaw, 1885 (3 species, *Trichobaris texana*, *T. trinotata*, with *mucorea* cited as synonym, and *T. plumbea*).

Henshaw, 1895 (*insolita*, *compacta*, and *cylindrica* added).

Leng, 1920 (6 species and 2 synonyms listed).

Leng, 1927 (12 species by Casey added).

### SPECIFIC NAMES AND GEOGRAPHICAL HABITATS

The geographical source of each sample or record has been carefully marked on a base map (fig. 1) here offered, in revised form, as a condensed record of the known habitats of the several species. These

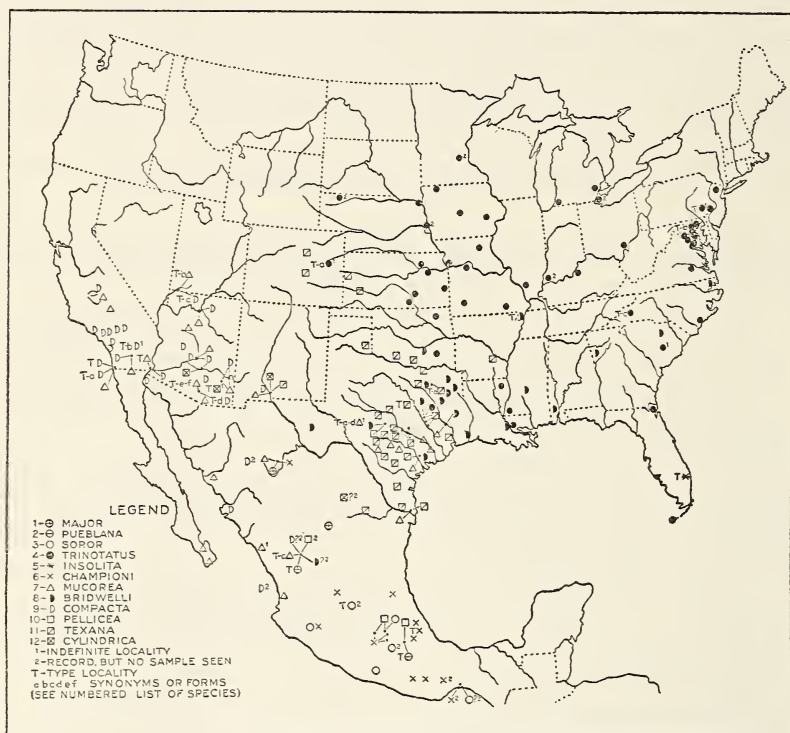


FIGURE 1.—Locality records for *Trichobaris*.

species are here distinguished by various symbols, explained on the map, to which the addition of a T indicates a type locality. The addition of a small letter denotes a particular subspecific name. The numeral 1 indicates that the exact locality within a State is not recorded. The numeral 2 denotes a published record for verification of which no samples are available. Most of such records have been ignored, but those involving type localities, and a few which would greatly extend the habitats based on available samples, are essential. For type localities of subspecific or synonymical names the following list of names should be consulted. In the case of localities from which several species are known, the symbols are grouped around the locality, which is indicated by a small dot.



TOBACCO STALK WEEVIL (*TRICHOBARIS MUCOREA*).

A, Average male, dorsal aspect; B, same, ventral aspect; C, same, lateral aspect; ♂, profile of male rostrum; ♀, profile of female rostrum. A-C,  $\times 10$ ; ♂, ♀,  $\times 25$ .





## LIST OF SPECIES, VARIETIES, AND SYNONYMS, WITH TYPE LOCALITIES

- (1) major, new species (*soror* Champion, in part; *soror* Casey). Durango, Durango, Mexico.
- (2) pueblana Casey, 1920 (*soror* Champion, in part). Puebla, Mexico.
- (3) *soror* Champion, 1909 (?*vestita* Boheman, in part, 1844). Guanajuato, Mexico.
- (4) *trinotatus* Say, 1831----- Pennsylvania.  
     *pensylvanicus* Say, 1831----- Do.  
     *vestita* Boheman, 1836 (restricted)----- Do.  
     *tripunctata* Boheman, 1836----- Do.  
     *cinereus* Boheman, 1836----- Do.  
     *trinotus* Westwood, 1844 (*5, p. lxxxix*)----- Do.
- (4a) *jejuniosa* Casey, 1920----- ?Colorado.
- (4b) ?*var. plumbea* LeConte, 1868----- Maryland.
- (4c) *impotens* Casey, 1920----- Black Mountain, N. C.
- (5) *insolita* Casey, 1892----- Southern Florida.
- (6) *championi*, new species (?*vestita* Boheman, in part). Cordoba, Veracruz, Mexico.
- (7) *mucorea* LeConte, 1858----- Yuma, Ariz.  
     (7a) *arida* Casey, 1920----- ?Texas.  
     (7b) *apicata* Casey, 1920----- St. George, Utah.  
     (7c) *rugulicollis* Casey, 1920----- Durango, Durango, Mexico.  
     (7d) *latipennis* Casey, 1920----- Texas.  
     (7e) ?*var. striatula* Casey, 1920----- Tucson, Ariz.  
     (7f) *nanella* Casey, 1920----- Do.
- (8) *bridwelli*, new species----- Caruthersville, Mo.
- (9) *compacta* Casey, 1892----- San Diego, Calif.  
     (9a) *densata* Casey, 1920----- Do.  
     (9b) *brevipennis* Casey, 1920----- Southern California.  
     (9c) ?*var. utensis* Casey, 1920----- St. George, Utah.  
     (9d) *retrusa* Casey, 1920----- Tucson, Ariz.
- (10) *pellicea* Boheman, 1844----- Mexico.
- (11) *texana* LeConte, 1876----- Texas (Belfrage, collector).  
     (11a) *amplicollis* Casey, 1920----- Terrell, Tex.
- (12) *cylindrica* Casey, 1892----- Southern Arizona.

## MATERIAL STUDIED; TYPES AND GROUP SAMPLES

The LeConte collection (examined Apr. 2, 1928) contains 21 specimens pinned as 4 species, the last of which was apparently added by Casey subsequent to LeConte's studies. For historical interest, a record of their identities and sequence is offered in the following list:

*Trichobaris texana* Lec. (Casey script on label covering LeConte's label "*Baris texanus*"), 5 specimens, the first 3 from Texas, the last 2, labeled Arizona, probably being large faded specimens of *cylindrica*.

"*B. 3-notatus* Say *vestitus* Sch" (LeConte script), 13 specimens included, representing 3 species as follows:

*trinotata*, specimens nos. 1, 2, 3, 4, and 12;

*compacta*, specimens nos. 6 and 11;

*mucorea* (sens. lat.), specimens nos. 5, 7, 8, 9, 10, and 13, the last being the type of *mucorea*.

*B. plumbea* Lec., the unique type.

*Trichobaris compacta* Casey (Casey script), 2 specimens which are probably paratypes from the original series of 50 specimens.

The Casey collection now contains 107 specimens of *Trichobaris* representing what that careful student considered as 23 species. Casey's known practice of attaching the name label to his chosen holotype leads to certain type-locality designation herein given, and to the citation of his types and paratypes. The writer's examination of all available specimens leads to the reunion of certain segregates and

the reduction of the number of distinguishable "species" to 12. Discussion of the Casey specimens will be found in the detailed notes on the various species.

In addition to the 128 specimens referred to above, which are chiefly of historical value since they are the basis of the American systematic contributions, there have been assembled in the National collection nearly 1,500 specimens of the genus *Trichobaris*, and all these have been critically examined in the study here recorded, while numerous other specimens received for examination have been returned to their senders. The writer is indebted to the several workers in economic entomology whose interest and industry have supplied this material. Field investigators (Joe Milam, E. G. Davis, K. B. McKinney, and others) of the former Bureau of Entomology, acting under the direction of J. E. Graf, in charge of its Division of Truck-Crop Insects, searched for these weevils during the period from 1925 to 1929, in the native and cultivated solanaceous plants surrounding the areas of experimental tobacco culture in southern Arizona, and submitted many specimens. Several other special investigations of local injury had previously been made by field agents of the Bureau of Entomology, among which should especially be mentioned that by J. C. Bridwell at Willis, Tex., in 1903. Following this work and up to the time of his death, F. H. Chittenden, of that Bureau, continued to assemble records and specimens, but he left no detailed treatment of the group. Under his direction the late C. H. Popenoe observed and collected these weevils in several localities in the Southwest. Specimens from Mexico have been relatively few, but Alfons Dampf, of the Oficina Federal para la Defensa Agricola in Mexico, has kindly supplied very interesting samples that were injuring tobacco, tomato, and *Datura*. There remain, however, large areas, inhabited by this genus of weevils, from which no specimens are available.

The scarcity of material from certain sources suggests a possible future reunion of the first 3 forms (*major*, *soror*, and *pueblana*), of the 12 herein considered, as perhaps geographically intergrading forms representing less than specific rank. Intergrades may be found to unite the last three forms (*pellicea*, *texana*, and *cylindrica*) also, but evidence permitting this treatment has not been observed and their specific distinctness is here accepted.

With the nomina nuda included as synonyms by Say and Boheman and thereby validated by them under the rules of the International Commission of Zoological Nomenclature, and counting the 3 new names proposed herein, there are now available in this genus 31 specific names. These were based upon 27 type series, of which 23 have been studied personally. The four that are inaccessible may now be briefly noted:

*soror* Champion. Type locality, Guanajuato. No specimen from this locality is available, and the six paratypes from other localities which were returned to the United States National Museum are now referred to *pueblana* and *major*.

*trinotata* Say. As herein indicated, Pennsylvania is the chosen type locality and neotypes are designated to replace the lost type.

*vestita* Boheman. Since this name is suppressed as a synonym of *trinotata*, for technical reasons inherent in the original publication, the writer believes that any other supposed type specimens of *vestita* cannot change his application of this name. If his argument as here presented is sustained, *trinotata*, *pennsylvanica*, *vestita*, *tripunctata*, *cinerea*, and *trinotus* are isotypic.

*pellicea* Boheman. Type locality, Mexico. Champion comments on receipt of a "type" labeled "Calif." which he states to be identical with *texana*. The latter is here treated as distinct, and Boheman's specific name is applied to the form from southern Mexico.

#### APPLICATION OF NAMES TRINOTATA, VESTITA, AND SOROR

In describing *Baridius vestitus*, Boheman records having before him Mexican specimens from Klug and Chevrolat and specimens from Mississippi communicated to him by Say. This latter fact, together with his inclusion of the citation to Say's published description of *trinotatus* among five citations of previously invalid pin-label names, names in litteris, and nomina nuda from the Melsheimer and the Dejean catalogs, shows plainly that Boheman's choice of Klug's previously invalid name *vestitus* in preference to Say's prior valid name is in violation of the law of priority. That he was mistaken in considering his Mexican specimens as conspecific with *trinotata* does not, in the writer's opinion, permit the adoption of his name *vestita* as the valid name of a Mexican species.<sup>3</sup>

It appears (1) that *vestitus* Boh. was based upon mixed material consisting of two or more species and upon Say's original description of *trinotatus*; (2) that Melsheimer and LeConte were within their rights in citing its synonymy with the previously valid specific name *trinotatus* Say; and (3) that these citations have the effect of restricting the name *vestita* to that part of Boheman's original complex which is actually Say's species, Say's original description having been cited by Boheman in his synonymy of *vestitus*. The subsequent identification of Boheman's specimens as other species should not affect this synonymy, but "*vestita* (Boh.) part" may be cataloged under each of the species that was in the material before him. The writer believes that the principle of following the first reviser (10, arts. 28, 31) invalidates Champion's revival of Boheman's name for the Mexican species which is herein described as new. He therefore designates *Baridius trinotatus* Say (1831) as type of *B. vestitus* Boheman (1844).

It seems necessary to subdivide the series of closely related forms originally included under the specific name *soror* by Champion (1909) for which he then selected types, male and female, from Guanajuato but did not record any particulars about them. His description appears to cover the composite material before him from 5 widely separated localities, and the 6 paratype specimens which he returned to the United States National Museum apparently represent 2 rather distinct forms. One of these forms (5 of the specimens) is *pueblana* Casey, and the other (the sixth specimen) agrees exactly with 3 specimens which Casey mentioned (1920, p. 381)<sup>4</sup> as *soror*, all 4 being from Durango. The latter form, being conspicuously different in habitus, is below given a new name, *major*, and Champion's specific name is applied with some doubt to samples, from the vicinity of the Mexican

<sup>3</sup> In 1849 Westwood (5) seems to have understood that the name *vestitus* was only a synonym, but neglected to cite Say, the author of *trinotatus*, and wrote the latter name "*Baridius trinotus (vestitus) Schönherr*." The Melsheimer catalog (1853) lists *vestitus* as an unquestioned synonym of *trinotatus*, and LeConte (1868) cites "*vestitus* † Sch. Curc. iii, 718" as a synonym of *trinotatus*, the double dagger indicating error, presumably in Boheman's choice of name. The Gemminger and Harold catalog (1871) adopts this synonymy, which is again used by LeConte (1876), and also by Casey (1892, p. 563), who remarks on the following page, however, that *mucoorea* (Lec.) is "perhaps identical with Boheman's *vestita*." Not accepting this usage, Champion (1909, p. 412) adopts the name *vestita* Boh. for the species common in Veracruz and Oaxaca but mentions that it was "sunk as synonymous with *T. trinotata*, Say, by LeConte." Leng (1920), however, does not follow Champion's opinion but lists *vestita* as a synonym of *trinotata*, as has heretofore been customary.

<sup>4</sup> See list of taxonomic papers, p. 3.



capital and from the Volcano of Colima, which do not agree with either of the forms mentioned above. As collections grow and larger series become available, it will be of interest to learn if geographical intermediates reunite these three named forms through intergrades in genital as well as external characters.

### GENERIC CHARACTERS AND GENOTYPE

In his key to genera, LeConte (1876) distinguishes *Trichobaris* as a new genus by the following characters: Pygidium vertical, exposed, fifth sternite short and subtruncate, antennal club entirely pubescent and annulate, claws approximate, front coxae not widely distant, and body densely scaly; and he adds a more detailed generic characterization. Three species (and a supposed variety) are there included; one of them, *Baridius trinotata* Say (1831), is now designated as genotype. Say, in his original description, states that it "inhabits United States" and that he had "obtained it in Indiana as well as in Pennsylvania." Since Say's types are lost, the latter locality, Pennsylvania, is now chosen as the restricted type locality, and two specimens in the Casey collection, labeled "Pa.", and agreeing in all characters with the original description, are hereby designated neotypes, male and female.

### SPECIFIC DISTINCTIONS

External specific differences are of course preferable for identification of species, but individual variations in vestiture, size, proportions, color, etc., are very common and often misleading. Mistaken views on the value of such differences as indicating specific distinctness have led to uncertainty of identifications and to much synonymy. In some species the rostrum exhibits marked peculiarities in length and curvature and its comparative measurement is made in lateral view from tip of mandibles to its junction with the front. No important differences in the legs have been observed, and the antennal club does not appear to present a satisfactory character. Yet "habitus", which cannot be successfully described or figured, is important. It is hoped that the characters used in the appended key may serve to identify the forms.

Possibility of hybridization is indicated not only by the pair (*texana* male, *mucorea* female) observed by Bridwell as mentioned later, but also by the habitus and markings of certain forms. If such crossing can have occurred, with modification of characters in successful descendant populations, *bridwelli* might have arisen through intermingling of *mucorea* and *compacta* (but, if so, why has it not been found where they occur together in California?), *major* might be *soror* modified by *mucorea*, *insolita* might be *trinotata* modified by some unrecorded introduction of *mucorea* into Florida, and *championi* as it occurs on tobacco in Chihuahua may have been modified by *mucorea* which was collected at the same place. However, the purpose of introducing such speculation here is to elicit evidence from field investigators engaged in combating pests of tobacco, potato, or other cultivated solanaceous plants. If hybridization occurs in spite of the theories of barriers in genitalic structure considered, the natural host-plant preferences may also be greatly modified.



Differences in the reproductive mechanism, by which perpetuation of the species is possible through the coadaptation of standardized genital structures of both sexes, are believed to be of the greatest taxonomic value. To display these structures in the male sex is very difficult, and in the female sex the shapes of the soft, membranous receptive cavity when filled cannot as yet be demonstrated.

#### MALE GENITALIA

(Figs. 2 and 3)

The male genitalia of most of the forms have been studied either dried after extraction from the abdomen or cleared and mounted in balsam. As is so thoroughly evident from the discussion in the outstanding paper on this subject, that by Sharp and Muir (13), and the points particularly emphasized by Sharp (12), the median lobe (the rigid male organ frequently mis-called "aedeagus") is merely the hardened capsule used to bring its enclosed membranous and invaginated "internal sac" into such position that the latter can enter into and fit the proper cavity in the female, so as to bring the orifice of its spermatic duct and the orifice of the duct leading to the receptaculum seminis together, forming a continuous conduit. It is therefore obvious that, although the strongly sclerotized and easily extracted median lobe may offer characters of considerable value (fig. 2), the chief specific differences may be found in the form of the evaginated internal sac (fig. 3). The difficulty of inflating and displaying this remarkable structure is so great that few students, it is feared, will be able to utilize its characters. Perhaps living specimens could be so treated, killed, and preserved that this organ could be easily examined, but in only one of the many hundreds of specimens of *Trichobaris* here studied was it extruded at death, and in this specimen (*trinotata*) it had collapsed in drying. This specimen was treated with caustic but, even before being mounted, the normal shape and structure of the sac were not determinable. After a successful inflation of the internal sac of *T. mucorea* was made, as shown in figure 3, *C* and *E*, and several not wholly satisfactory preparations of *trinotata*, this structure was better understood and the preliminary sketch of the sac in the latter species was redrawn (fig. 3, *A*) to indicate its probable form and the position of the apical abdominal structures. Incomplete inflation of the internal sac of *T. bridwelli* was also obtained and is shown in figure 3, *F*, in which the position of the dorso-basal lobe, as crumpled into the base in the preparation, and its probable position when inflated are indicated.

In its normal position the orifice (*mo*) of the median lobe (*ml*) is partly closed by a pair of sclerotized plates (*op*) which differ more or less in shape in the different species. They present a misleading appearance of being the apices of internally attached processes but are in reality more heavily sclerotized areas of the sac (*is*), hinged along their oblique outer apical margins and assuming a lateral position on the base of the sac when extended.

At the mid-dorsal margin of the orifice a flexible, narrow, infusate median area of the sac folds under and enters the orifice, becoming the mid-dorsal brace supporting the apex of the strongly sclerotized transfer apparatus (*ta*), which usually lies at or behind the basal

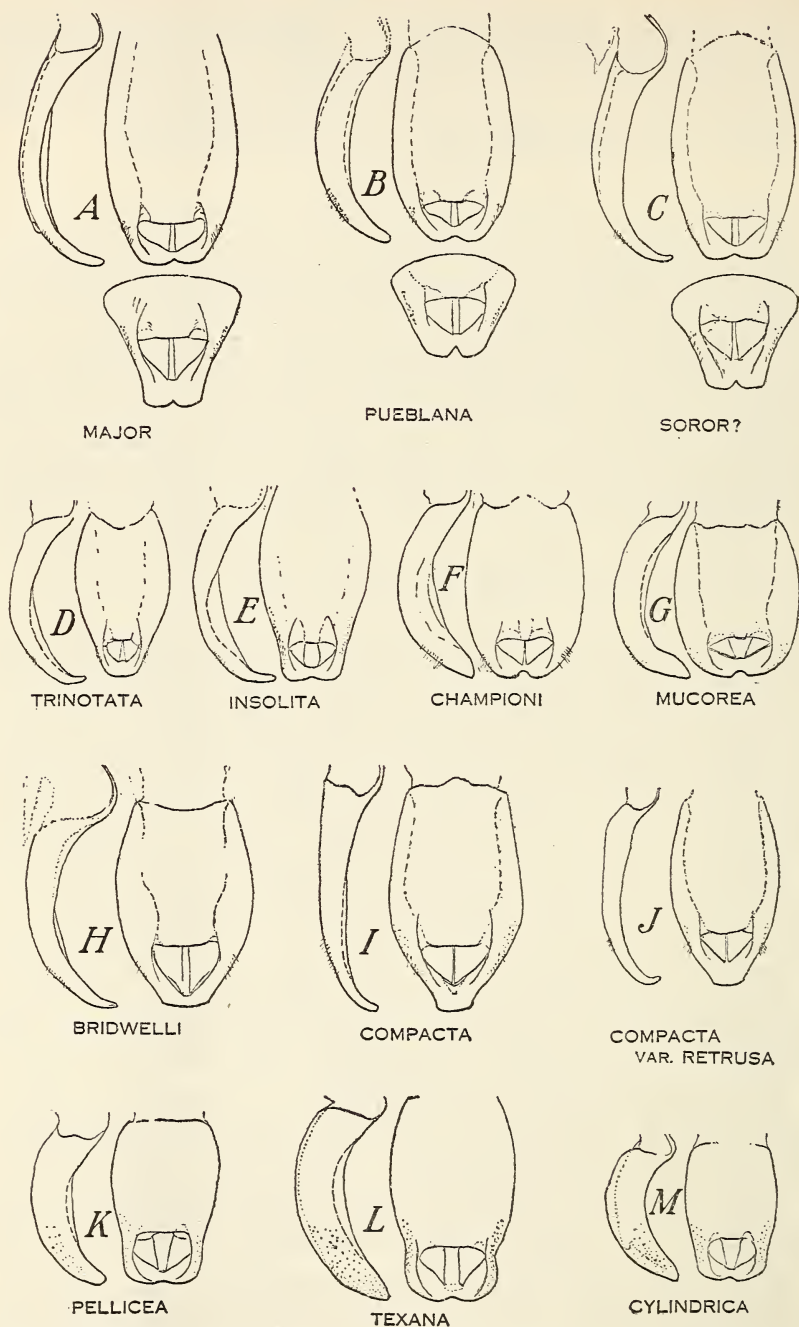


FIGURE 2.—Outlines of median lobe, or rigid male reproductive organ, of the species of *Trichobaris*, lateral, dorsal, and (in A-C) apical aspects: A, *T. major*; B, *T. pueblana*; C, *T. soror*; D, *T. trinotata*; E, *T. insolita*; F, *T. championi*; G, *T. mucorea*; H, *T. bridwelli*; I, *T. compacta*; J, *T. compacta*, var. *retrusa*; K, *T. pellicea*; L, *T. texana*; M, *T. cylindrica*.  $\times 40$ .

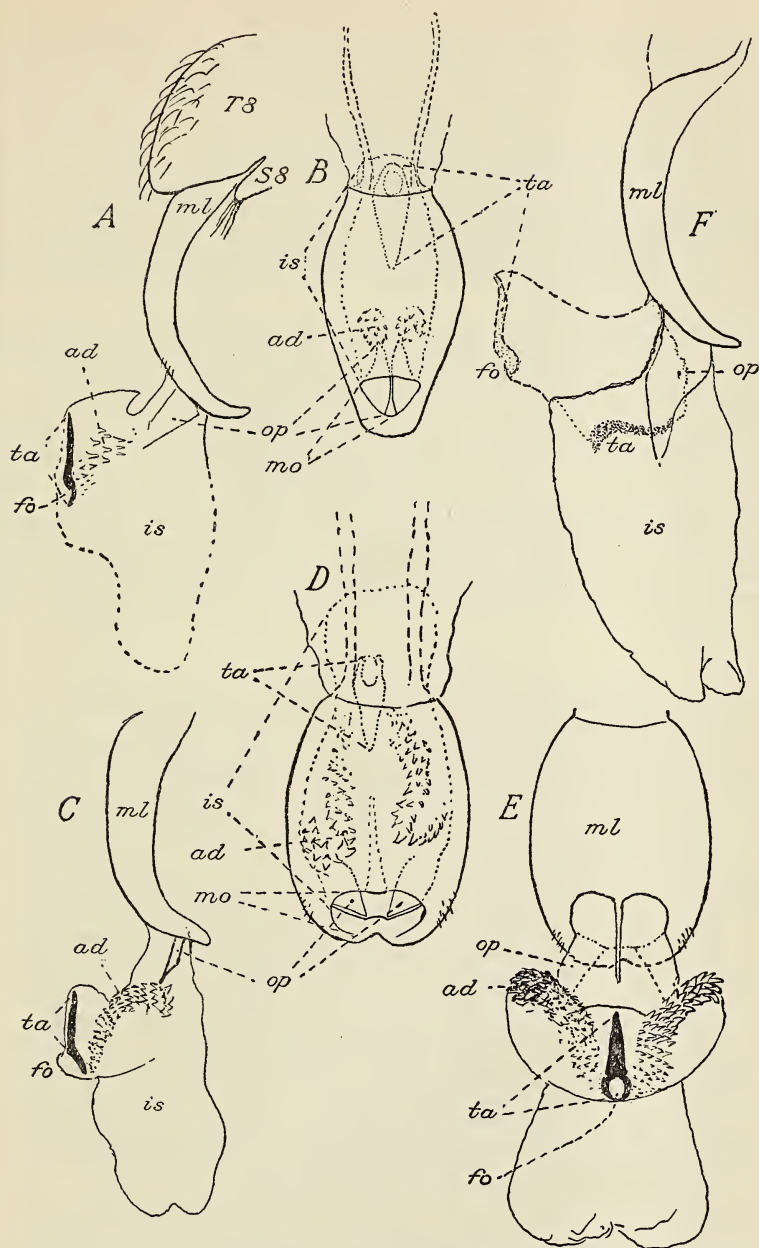


FIGURE 3.—Three forms of the male copulatory organ of *Trichobaris*: A, *T. trinotata*, lateral aspect showing tergite (T8) (pygidium) and vestigial sternite (S8) of eighth abdominal segment with extruded median lobe and partly inflated internal sac; B, same, dorsal aspect of median lobe, cleared, showing position of internal sac when invaginated; C, *T. mucorea*, lateral aspect of median lobe and internal sac; D, same, dorsal view of median lobe, cleared to show position of internal sac when invaginated; E, same, dorsal aspect of preparation shown in C; F, *T. bridwelli*, lateral view with internal sac not fully evaginated, the probable outline of basal lobe supporting the transfer apparatus, when fully inflated, indicated by broken line, and its crumpled position within base of sac in the preparation indicated by dotted line. All  $\times 60$ . Abbreviations used: ml, Median lobe; mo, median orifice; is, internal sac; fo, functional orifice; ta, transfer apparatus; op, orificial plates; ad, armed diverticulum. The tegmen and its processes are omitted in all figures.

margin of the median lobe but when evaginated reverses its position and becomes the dorsal summit of the sac. In *T. mucorea* (fig. 3, *C-E*) the basal, latero-dorsal diverticula (*ad*) are armed with strongly sclerotized denticles, resembling in shape the teeth of a shark; these are larger externally and occur in rows of four but are smaller and more numerous towards the functional orifice (*fo*). In *T. trinotata* (fig. 3, *A-B*) this armature is composed of smaller, simpler, more feebly sclerotized, and less numerous teeth, which are conspicuous only at the summit of the diverticula. In the usual invaginated condition, the armature of *mucorea* is withdrawn and contracted in the position shown in figure 3, *D*, and in *trinotata* this cluster is similarly indicated in figure 3, *B*.

In *bridwelli* (fig. 3, *F*) the internal sac appears to be laterally compressed, and without armature or baso-lateral diverticula, the denticles being reduced to microscopic dots. The apical portion is produced into blunt, conical, divergent, lateral lobes, and the transfer apparatus, although not properly extended in the writer's preparation, should assume its mid-dorsal position at the summit of a narrow basal lobe, as indicated by broken lines in the figure. The orificial plates are so large that they must bend greatly in emerging from the median orifice. They occupy a more lateral position than in *mucorea*, in which they are more divergent and face almost directly ventrally. The abbreviations in figure 3 are mostly adopted from Sharp (1918).

#### KEY TO SPECIES

1. Female with last visible ventral segment medially carinate at apex, and with rostrum much longer and less curved than in male.----- 2  
     Female with last visible ventral segment simple, and with rostrum only slightly longer than, and similar to, that of male.----- 4
2. Female rostrum relatively longer (usually three-fifths longer, apex to front) than pronotum; dorsal vestiture composed of fine, long, slender scales of cinereous or dull ochreous color; apical half of last ventral segment of female with acute median carina, which is feebly dentiform before apex.----- 3  
     Female rostrum relatively shorter (usually one-half longer, apex to front) than pronotum; dorsal vestiture composed of broader, light ochreous scales hiding more of the integument; apical half of last ventral segment of female with feeble median carina; propleurae with two large black spots in which each puncture holds a small black scale instead of the large, broad, yellowish-white scales normal to other punctures; ventral concavity of male densely clothed with rather broad scales; apex of median lobe (fig. 2, *A*) more produced. Length 5.8-6.1 mm. Durango City, Torreon, Chihuahua.----- (1) *major*, new species, p. 14
3. Propleurae immaculate; carina on last ventral segment of female shorter and more dentiform at about apical fifth of sternite. Length 4.5-5.3 mm. Puebla (State) and Mexico City.----- (2) *pueblana* Casey, p. 16  
     Propleurae bimaculate (as in *major*); carina on last ventral segment of female longer and a little less prominent. Length 4.2-5.5 mm; Mexico City, Tlalpam, and Volcano Colima.----- (3) *soror* Champ.?, p. 16.
4. Propleurae black or with black spots due to scales in certain punctures being small and black, the black spots obsolescent in some species and coalescent in others; prehumeral discal black spot (consisting of narrow, erect, black scales) conspicuous and common to base of pronotum and elytra.----- 5  
     Propleurae uniformly clothed with white scales which are usually broad and densely placed; prehumeral black spot greatly reduced and less conspicuous.----- 11



5. Rostrum slender, distinctly longer than pronotum; size smaller, form more slender; male ventral impression narrow and rather deep, clothed with decumbent scales; median lobe broad at basal third, the apex strongly narrowed and deflexed. Eastern and Southern States----- 6
- Rostrum stout, about as long as pronotum (slightly longer in *championi*); size larger, more robust; male ventral impression broad. Mexico and adjacent parts of United States----- 7
6. Vestiture composed of fine scalelike hairs, rather sparsely placed and exposing much of the integument, usually in three series on the elytral intervals; propleural and basal pronotal spots conspicuous and each composed of numerous black scales; apex of median lobe (fig. 2, *D*) narrowly rounded and entire. Length 3-5 mm. New Jersey to Florida, westward to Minnesota, Colorado, and Texas.  
(4) *trinotata* Say, p. 17.
- Vestiture composed of short, much broader scales, usually in four series on elytral intervals; propleural and basal pronotal black spots obsolescent, the former consisting of only a few black scales; apex of median lobe (fig. 2, *E*) emarginate. Length 4.2-4.7 mm. On *Physalis* at Lake Worth, Fla. (Hamilton)----- (5) *insolita* Casey, p. 18.
7. Propleural maculae large, frequently confluent; form more nearly parallel and less convex; pronotal side margins nearly straight, slightly convergent in basal three-fourths, and with slight or evident emargination about middle; discal vestiture hairlike, exposing the sculpture; median lobe short, broadly oval, and strongly emarginate at apex-- 8
- Propleural maculae smaller, never confluent; form more oval, the elytral disk distinctly convex; pronotal side margins evenly arcuate from base to apical constriction; discal vestiture scalelike, obscuring the sculpture; median lobe attenuate apically, subtruncate, not emarginate----- 10
8. Male ventral concavity on first and second sternites clothed with densely placed, suberect, posteriorly radiating white scales; glabrous areas on third and fourth sternites reduced in both sexes by development of apical areas of suberect white scales; last ventral segment with median vestiture coarse, resembling the suberect scales of the preceding segments; median lobe (fig. 2, *I*) with orificial plates subcontiguous, Length 4-5.5 mm. Mexico---(6) *championi*, new species, p. 19.
- Male ventral concavity on first and second sternites clothed with densely placed, appressed scales lying parallel to axis of body; apical marginal punctures of third and fourth sternites supporting black hairs instead of white scales; last ventral segment with median vestiture much finer and more decumbent; median lobe (fig. 2, *J*) with orificial plates widely separated, small, and subconical. Length 4-6.8 mm. California, Texas, and Mexico---(7) *mucorea*, sens. lat. (p. 20). 9
9. Dorsal vestiture more conspicuous, imparting a light gray tone to the habitus; elytral interstices less convex, the vestiture contributing to a plane or very feebly sulcate appearance of the elytra. Utah, Texas, Mexico-----*mucorea* Lec., normal form
- Dorsal vestiture less conspicuous, imparting a dull gray tone to the habitus; elytral interstices more convex, the vestiture contributing to the distinctly sulcate appearance of the elytra. Length 3.4-6 mm. Tucson, Ariz-----*mucorea*, variety *striatula* Casey
10. Vestiture dense, each scale extending beyond base of the following scales; propleural spots composed of few black scales, about 6 in posterior and 12 in anterior spots; submarginal basal black pronotal spots large; median lobe (fig. 2, *H*) broadly oval, tapered into a produced, deflexed, truncate apex, the orificial plates almost contiguous. Length 4.5-6 mm. *Datura* pods, Texas to Georgia----- (8) *bridwelli*, new species, p. 23.
11. Form broadly oval, somewhat depressed, longitudinally more convex, with elytral apices more declivous; pronotum widest near base; abdominal impression of male clothed with appressed scales; median lobe (fig. 2, *F*) broadest at apical third, the attenuate apex strongly deflexed, narrow and truncate. Length 3.7-6 mm. Utah to Mexico, California to New Mexico---(9) *compacta* Casey, p. 24.

Form narrow, parallel, and subcylindrical; pronotum widest before middle and more gibbous; abdominal impression of male clothed with suberect hairs; median lobe subquadrate, the broad subtruncate apex feebly emarginate and but slightly narrower than the base.

12

12. Dorsal vestiture, especially on pronotum, composed of fuscous scales interspersed among white ones, the scales irregular in appearance and not closely appressed on surface; median lobe (fig. 2, *K*) intermediate in form between those of following two species, but the orificial plates usually more widely separated. Length 3.6–5 mm. Near Mexico City ----- (10) *pellicea* Boh., p. 26.

Dorsal vestiture uniformly pale cinereous, the scales more regularly placed and only slightly raised above surface; median lobe (fig. 2, *L*) more elongate, the apical portion usually somewhat widened behind the constriction at base of orifice, the apex more distinctly bilobed and the orificial plates more approximate. Size usually larger; length 4–5.5 mm. Texas to Kansas ----- (11) *texana* Lec., p. 26.

Dorsal vestiture composed of shorter, broader, regularly placed, appressed, oval scales, cinereous to red-ochreous; form narrower and more cylindrical; median lobe (fig. 2, *M*) shorter, less narrowed apically. Size usually small; length 3.4–4.7 mm. Arizona, New Mexico ----- (12) *cylindrica* Casey, p. 27.

## NOTES AND RECORDS BY SPECIES

### (1) *TRICHOBARIS MAJOR*, new species

(Fig. 2, *A*)

*Trichobaris soror* Champion, 1909, Biologia Centrali-Americana. Insecta. Coleoptera, v. 4 (pt. 5), p. 413 (in part); Casey, 1920, Memoirs on the Coleoptera, v. 9, p. 381.

Robust, subcylindrical, the dorsum considerably flattened; subparallel, the pronotum one-fifth narrower and more convex than elytra; densely and conspicuously clothed with decumbent scales which are ochreous, smaller, narrower, and not quite contiguous on pronotum and elytra, white, larger, broader, and often overlapping on metasternum and abdomen, and much reduced in size, black, and inconspicuous in a few small black areas on base of pronotum, on sides of rostrum, and on propleura and mesopleura.

Rostrum of male very slightly (almost one-tenth) longer than pronotum, slightly curved, subcylindrical, moderately stout, one-fifth as wide as long, and clothed with ochreous scales of same nature and density as on pronotum; antennal articulation two-fifths from apex; funicle and basal joint of club conspicuously cinereo-pubescent, conical apex of club silky, black, with metallic reflections. Rostrum of female about one-half longer than pronotum, very slightly curved, laterally compressed in front of antennal sockets, which are just before middle, tapering in vertical thickness from a diameter of about an eighth of its length at base to about an eleventh near apex, vestiture more sparse than in male, and on the sides near base the scales black instead of ochreous.

Pronotum one-fourth to one-eighth wider than long, base twice as wide as apex, sides strongly arcuate, more evenly curved in the female, the male showing a slight sinuosity at about middle of side margin; hind margin with prescutellar and larger prehumeral areas of black scales. Propleurae with large, oval, ochreous to cinereous scales except in two irregular areas near upper margin where the scales are

black and so small that the large, round, subcontiguous punctures are entirely visible. A similar area of small, black scales appears on the mesepimeron of the female, but the male has the sclerite uniformly cinereo-squamose. Scutellum short, strongly transverse, nude, and finely punctate, concave surface rising to acute apical angles.

Elytra one-fifth wider than pronotum, two-thirds as wide as long, sides parallel to apical third, which (including pygidium) is evenly semicircular in outline, although the elytral apices themselves are separately broadly rounded; surface transversely nearly flat across the prominent humeri, more convex posteriorly, the declivity feebly impressed behind and below the pair of gibbosities at about apical sixth; sculpture entirely obscured by the dense vestiture, which consists of elongate, narrowly oval, curved, decumbent scales about 0.1 mm long and 0.02 mm wide, arranged in five irregular rows on each interval, the scales overlapping longitudinally but separated laterally by nearly their own width; the outer rows on each interval directed slightly outward so as partly to cover the stria; at extreme apex a small sutural area of narrower, suberect, black scales. Pygidium clothed rather densely with erect, pale ochreous scales. First ventral abdominal segment clothed with appressed, broadly oval, subtruncate, white scales, overlapping on sides, but towards middle of ventral impression of male becoming narrower and slightly sparser, exposing intervals of shining integument. Third and fourth sternites with the usual nude median areas reduced by 2 or 3 rows of broad, white scales on apical margin in the male, and still more reduced by extension of the white, squamose areas in the female. Vestiture of fifth sternite grading from broad, decumbent, white basal and sublateral scales to fine, suberect, ochreous setae over the feeble longitudinal median carina in apical half.

Length 5.8–6 mm, width 2.4–2.7 mm.

*Type locality*.—Durango City, Mexico.

*Type and paratypes*.—Type male and following 9 paratypes: 2 males and 5 females, United States National Museum catalog no. 50861, and 1 male and 1 female returned to Mexico.

Described from a male and two females, collected by H. F. Wickham, in the Casey collection and a female collected in the same locality by Edward Palmer in July 1896, the latter being the Durango paratype of *soror* Champion (U. S. National Museum catalog no. 21992). A male and a female (the former with black-scaled macula on epimeron as in the female) from Torreon, May 1931, collected by G. del Campo on "toloache" (*Datura stramonium*), and 2 males and 2 females from Chihuahua, Chihuahua, May–June 1931 (Del Campo) submitted by Alfons Dampf, are included as paratypes. The dorsal vestiture is slightly paler in two individuals.

Besides its distinctive habitus, which is due to the larger size, different proportions, and the color of the denser vestiture, the male genitalia seem to demand segregation of this form as a specific unit. The median lobe (fig. 2, A, lateral, dorsal, and apical aspects) is a little more depressed, more curved, and more produced apically than in either *soror* or *pueblana*, and the sclerotized median area of the basal margin of the orifice is broader, the membranous area at its sides being reduced to about half its width.



The Durango specimens with brownish-ochreous dorsal vestiture and propleural black spots, mentioned by Champion (1909) as a variation of *compacta*, may be males of this species.

(2) *TRICHOBARIS PUEBLANA* Casey

(Fig. 2, B)

*Trichobaris soror* Champion, 1909, *Biologia Centrali-Americana*. Insecta. Coleoptera, v. 4 (pt. 5), p. 413 (in part).

*Trichobaris pueblana* Casey, 1920, *Memoirs on the Coleoptera*, v. 9, p. 382.

Casey's type (female) and 2 paratypes (a male and a female) (U. S. National Museum catalog no. 37733) agree well with 5 male paratypes (U. S. National Museum catalog no. 21992) of *soror* returned to the National collection by Champion. Three of these are labeled "Herrera No. 1865" and are without locality label, but 2 were received from the Mexican National Museum and bore the yellow label indicating the State of Puebla. Another male specimen in the Casey collection, standing as his second example under the name *vestita* Boh., is now referred to this species but is labeled "Mexico City, Hoege." Yet another male from the Federal District (Conradt) appears to be *pueblana*, which may or may not be distinguishable from *soror* when additional material is accumulated, Casey's concept of the latter having been based upon the form from Durango here named *major*. Ten specimens have been studied, only 2 of them being females.

The aedeagus of one of the paratypes of *soror*, from the State of Puebla, is illustrated (fig. 2, B, lateral, dorsal, and apical aspects).

(3) *TRICHOBARIS SOROR* Champion

(Fig. 2, C)

*Baridius vestitus* Boheman, 1844, in Schoenherr, *Genera et Species Curculionidum*. . . v. 8, (pt. 9), p. 171 (in part, fide Champion).

*Trichobaris soror* Champion, 1909, *Biologia Centrali-Americana*. Insecta. Coleoptera, v. 4 (pt. 5), p. 413, pl. 20, figs. 23, 23a (in part).

Champion states that his selected types are from Guanajuato, but his description seems to be drawn to cover composite material without particular allusion to his type. The specimens he returned to the National Museum consisted only of males of *pueblana* Casey and one female described above as *major*. No specimens from the type locality or from three other localities mentioned by him, Parada, Tehuantepec, and Matamoros Izucar, are available. The 18 specimens now doubtfully placed under this name comprise three slightly dissimilar lots—one from Colima Volcano (Conradt), 4 males and 1 female; another from Tlalpam, Distrito Federal, July 1922, on *Datura* (Smyth), 4 males; and the third from San Jacinto, Distrito Federal, October 1931 (Dampf), 2 males and 3 females—as well as single specimens probably from near the Mexican capital. Some from this last locality are individuals almost identical with *pueblana*, except that the propleural black spots are present. The sample from Dr. Dampf includes pupal cells imbedded in seeds of *Datura*, indicating that this species may not be a stem borer. A poorly preserved male intercepted February 27, 1925, at El Paso, Tex., by the Federal Horticultural Board (El Paso no. 193) appears to be this species.

The aedeagus of a male from Tlalpam is figured (fig. 2, C, lateral, dorsal, and apical aspects).



## (4) TRICHOBARIS TRINOTATA (Say)

(Fig. 2, *D*, and fig. 3, *A* and *B*)

*Baridius trinotatus* Say, 1831, Descriptions of New Species of Curculionides of North America . . . New Harmony, July 1831, p. 17; reprinted in LeConte edition of Say's Complete Writings, 1859, v. 1, p. 280.

(*Baridius*) *Curculio trinotatus* "Melsh. Catal." Say, 1831, p. 17.

(*Baridius*) ——— *pensylvanicus* K. "Melsh. Catal." Say, 1831, p. 17.

*Baridius vestitus* Boheman, 1836, in Schoenherr, Genera et Species Curculionidum . . . v. 3 (pt. 2), p. 718.

(*Baridius*) *Baris vestita* "Klug" Boheman, 1836, p. 718.

*Baridius tripunctatus* "Chevrolat" Boheman, 1836, p. 718.

(*Baridius*) *Baris cinereus* "Dejean" Boheman, 1836, p. 718.

*Baridius trinotus* (*vestitus* Schönherr) Westwood, 1849, Ent. Soc. London Proc. 5: lxxxix.

*Baridius plumbeus* LeConte, 1868, Acad. Nat. Sci. Phila. Proc. 20: 364.

*Baris trinotata* (Say) Gemminger and Harold, 1871, Cat. Coleop., v. 8, p. 2628.

*Trichobaris trinotata* (Say) LeConte, 1876, Amer. Phil. Soc. Proc. 15: 288; (Say) Casey, 1892, N. Y. Acad. Sci. Ann. 6: 363; (Say) Blatchley and Leng, 1916, Rhynchophora or Weevils of North Eastern America, p. 375.

*Trichobaris plumbea* LeConte, 1876, p. 288.

*Trichobaris jejuniola* Casey, 1920, Memoirs on the Coleoptera, v. 9, p. 377.

*Trichobaris impotens* Casey, 1920, p. 378.

*Trichobaris insolita* Hayes, 1935, Brooklyn Ent. Soc. Bull., v. 30, p. 28 (in part).

The isotypic synonymy of *trinotata*, *pensylvanica*, *vestita*, *tripunctata*, *cinerea*, and *trinotus* has already been mentioned (p. 6), and male and female neotypes from Pennsylvania in the Casey collection are designated under United States National Museum catalog no. 50865.

The type of *plumbea* in the LeConte collection at the Museum of Comparative Zoology, Cambridge, Mass., is a small female specimen, 3 mm long, 1.1 mm wide at humeri, labeled with a pink disk, and placed by itself after the series of *trinotata*. It is indistinguishable from the female type and male paratype of *impotens* Casey (U. S. National Museum catalog no. 37725), all 3 having the vestiture more scanty, the elytral intervals narrower with the scales more often only 2 abreast instead of in 3 irregular rows, and in other respects agreeing with dwarf individuals of *trinotata*. One such depauperate sample from Florida was given to Dr. Chittenden by Colonel Casey prior to his 1920 study and bears Say's specific name in Casey's handwriting. In the LeConte collection the name label "*trinotatus* Say *vestitus* Sch." is followed by 13 specimens, of which nos. 1, 2, 3, 4, and 12 are normal specimens of this species, the others being mentioned below under *mucorea* and *compacta*.

The unique male type of *jejuniola* Casey of unknown habitat (U. S. National Museum catalog no. 37726) seems to be indistinguishable from *trinotata* but has not been dissected.

The 6 specimens in the LeConte collection, 16 in the Casey collection, and about 175 other specimens in the National collection supply the localities indicated on the map (fig. 1). This species is well known for its injury to potato and eggplant but is also a serious pest of belladonna. Its uncultivated host plants are *Solanum carolinense* (many records), *S. nigrum* (1 record), *S. rostratum* (1 record), and *Physalis* (a few records). Specimens labeled "on corn" and "on artichoke" were probably migrating individuals. No published record of attack on tobacco has been found, but under date of June 4, 1932, C. H. Brannon submitted a sample (5 males and 11 females

ranging from 3.4 to 4.5 mm in length) of this species which was damaging tobacco in Onslow County, N. C., by eating into the midribs of the leaves, and under date of June 21, 1933, L. Haseman submitted a sample (2 males and 3 females) reported as doing considerable damage to tobacco in several fields in Platte County, Mo. Somes' experimental transfer of larvae to tomato (14) indicates the possibility of attack on this plant, but the stimulus inducing oviposition may be absent. Important facts relative to its natural transfer to cultivated plants remain to be observed.

Chittenden (1, pp. 9-18) in 1902 reviewed the accumulated information on this species then available, but it is possible that his host-plant records of *Datura* may have been from some other species of weevil, as also the reference to cocklebur (*Xanthium*). The same author (3, pp. 88-89) in 1911 adds a few more records. The later statement by Morrill (11) of its occurrence in Arizona and those by Essig (6, p. 303; 7, p. 405) of injury to potato stalks in California are believed to be based upon misidentifications of *mucorea*. Four of the five specimens from Kansas and Illinois recently recorded under the name *insolita*, as cited above, are referable, from the writer's examination, to *trinotata*.

An early biological and economic record of this species seems to have been overlooked. As it occurs in a journal rarely available to the economic investigator, is very brief, and agrees with certain details discovered and recorded by Somes (14), the paragraph in the minutes of the meeting of the Entomological Society of London (5), December 3, 1849, is here quoted in part:

Mr. Westwood also exhibited specimens, in all its stages, of *Baridius trinotus* (*vestitus*, Schönherr) \* \* \* having been observed by Miss Morris, of Germantown, to attack the potatoes \* \* \* to such an extent as to have led to the belief of its being the real cause of the potato disease. The eggs are deposited in the leaf-buds and the larvæ, as soon as hatched, burrow into the stems, within which they feed, descending to the root and causing the decay of the plant.

(5) *TRICHOBARIS INSOLITA* Casey

(Fig. 2, E)

*Trichobaris insolita* Casey, 1892, N. Y. Acad. Sci. Ann. 6: 565; (Casey) Blatchley and Leng, 1916, Rhynchophora or Weevils of North Eastern America, p. 375.

The type and only specimen in the Casey collection (U. S. National Museum catalog no. 37741) is a female, labeled only "Fla", but recorded as having been collected in the extreme southern part of the State by Mr. Kinzel. Four specimens, 2 females and 2 males, in the Hubbard and Schwarz collection are from Lake Worth, Fla., and are probably part of the colony in which adults were found abundantly on one occasion in April in a patch of *Physalis*, as reported in 1895 by Hamilton (8, p. 321), who could not find the species again either in the same patch or elsewhere. The opinion held in 1902 by Chittenden (2, p. 69), and adopted by Blatchley and Leng in 1916, that this species was responsible for injury to tobacco at Quincy, Fla., is not supported by specimens before the writer, and the attack may have been by some other species. An erroneous record of *insolita* as from Kansas and Illinois was based upon specimens mentioned here under *trinotata* and *texana*.

The five specimens resemble *trinotata* in size and shape, as well as in the elongate rostrum of both sexes, but the vestiture consists of

much broader scales throughout, these producing a very different habitus. The prehumeral black spots are obsolete, the propleurae are very inconspicuously bimaculate, the spots composed of very few (1 to 4) black-scaled punctures, and the elytral apices are not ornamented with a conspicuous area of suberect black hairs. The sides of the pronotum are more convergent anteriorly, less rounded in basal half, and more arcuate to apical third. The vestiture of the pronotum and elytra is composed of short, rather broadly oval, subtruncate, recumbent, white scales, which are narrowly separated laterally and often overlap the basal fourth of the succeeding scale. The ventral vestiture is composed of broader scales completely hiding the integument in some areas, but in the ventral depression of the male the scales become much narrower and are separated laterally by about their own width. The postcoxal lobe of the prosternum is gibbous and clothed with suberect scales. In the male the apical lobe of the last sternite is short and feeble, about twice as wide as long and a tenth as wide as the pygidium.

(6) *TRICHOBARIS CHAMPIONI*, new species

(Fig. 2, F)

?*Baridius vestitus* Boheman, 1836, in Schoenherr, *Genera et Species Curculionidum* . . . , v. 3 (pt. 2), p. 718 (in part).

*Trichobaris vestita* Champion, 1909, *Biologia Centrali-Americana*. Insecta. Coleoptera, v. 4 (pt. 5), p. 412.

*Type locality*.—Cordoba, Veracruz, Mexico.

*Type and paratypes*.—Type, male, and 63 paratypes, United States National Museum catalog no. 50862, and 20 paratypes returned to the Mexican Oficina Federal para la Defensa Agricola.

Twenty-five of the more than eighty specimens here included were identified as *vestita* Boh. by the late G. C. Champion, whose name is now applied to the species in recognition of his many and great services to those interested in neotropical beetles. Of this series, 18 specimens, including the selected type, were from Cordoba, Mexico (Knab), 3 from Orizaba (Bruner), 1 from Cuernavaca (O. W. Barrett), 1 lacks locality, and 2, 1 of which is in the Casey collection, are labeled "Oaxaca, Mexico, Hoege", from the Godman and Salvin collection. Four paratypes were extracted from pupal cells in stems of *Physalis* at Aguascalientes, Mexico, by F. C. Bishopp, November 30, 1909; 3 were collected on *Datura* at Tlalpam, Mexico, July 14, 1922, and 1 on *Solanum* at Coapa, Distrito Federal, Mexico, June 26, 1922, by E. G. Smyth; 6 are from Colima Volcano (L. Conradt); 1 is labeled "Mexico, D. F., J. R. Inda"; 1 from the Gorham collection is labeled "*vestitus*, Mexico"; and 1 in the Casey collection is from Orizaba; while more than 40 specimens submitted, through the courtesy of Alfons Dampf, by the Mexican Oficina Federal para la Defensa Agricola, include the first ones known to be associated with tobacco and tomato. Of these last, 12 females and 1 male, from Cordoba, Veracruz, represent 3 lots labeled "49/30 Flores moscucla", "50/30 tabaco, 21, IV, 30", and "183/30 Flores tabaco"; another, from El Maguey, Veracruz, 323/30, is also labeled "Flores tabaco"; 4, labeled "Moscucla Tab", are reported as from Putla in western Oaxaca; 6 are labeled as from tobacco at Camargo, Chihuahua, September 30, 1930, no. 618/30 (the same number occurring also on a pair of typical *mucorea*); a series of 13 specimens under nos. 569-31



and 753-31 from Iguala, Guerrero, collected by Montufar, are from tomato in August and September 1931, some being accompanied by pupal cells and labeled "tallos de tomato"; and 5 are from Coatepec, Veracruz, without additional data.

This species differs from all others known to the writer in the male ventral abdominal vestiture, which, although consisting of similar scales throughout, is conspicuously differentiated within the concavity, in that the median and posterior scales are suberect and strongly radiating posteriorly, the two centers of radiation being located at about the middle of the first segment and at the base of the second segment. The nude polished median areas of the third and fourth segments are much reduced in both sexes by median and marginal areas of punctures, each of which bears a suberect white scale, and the vestiture of the fifth sternite becomes finer and suberect at the middle. The vestiture of the dorsum is rather fine and usually of a pale brownish color; that of the sides, venter, and legs consists of broad white scales, but in a few samples the dorsal scales are black. The rostrum is similar in the two sexes, being about as long as the pronotum in the males and about a tenth longer in the females. The size ranges from a few dwarfs about 4 mm long to maximum specimens about 6 mm long. The larger females are associated with tobacco records and are extremely similar to females of *mucorea* except in the median vestiture of sternites 3 and 4. The median lobe (fig. 2, *I*) is similar in shape to that of *mucorea*, but differs in the stronger development of the subapical tufts of fine hairs, and in the large, subcontiguous orificial plates.

(7) *TRICHOBARIS MUCOREA* (LeConte)

(Pl. 1; fig. 2, *G*; fig. 3, *C-E*)

*Baridius mucoreus* LeConte, 1858, Acad. Nat. Sci. Phila. Proc. 10: 79; LeConte, 1868, Acad. Nat. Sci. Phila. Proc. 20: 364.

*Baris mucorea* (Lec.) Gemminger and Harold, 1871, Catalogus Coleopterorum . . . , v. 8, p. 2625.

*Trichobaris trinitata* var. *mucoreus* LeConte, 1876, Amer. Phil. Soc. Proc. 15: 288.

*Trichobaris mucorea* (Lec.) Casey, 1892, N. Y. Acad. Sci. Ann. 6: 562, 564; (Lec.) Champion, 1909, Biologia Centrali-Americana. Insecta. Coleoptera, v. 4 (pt. 5), p. 413.

*Trichobaris striatula* Morrill, 1915, Ariz. Comn. Agr. and Hort. Rept. 7: 42, figs. 13, 14; Essig, 1915, Sup. Calif. State Comn. Hort. Monthly Bull. 4, pp. 303-305, figs. 297-300; Essig, 1926, Insects of Western North America, p. 405, figs. 412-414.

*Trichobaris striatula* Casey, 1920, Memoirs on the Coleoptera, v. 9, p. 374.

*Trichobaris nanella* Casey, 1920, p. 375.

*Trichobaris latipennis* Casey, 1920, p. 376.

*Trichobaris apicata* Casey, 1920, p. 376.

*Trichobaris arida* Casey, 1920, p. 377.

*Trichobaris rugulicollis* Casey, 1920, p. 378.

The unique type of *mucorea* in the LeConte collection at the Museum of Comparative Zoology, Cambridge, Mass., was found to be the thirteenth and last specimen pinned under the specific name *trinitata*, probably as rearranged during preparation of the great work on Rhynchophora by LeConte and Horn (1876). Thirty types and paratypes of the other six specific names by Casey (1920) are entered under United States National Museum catalog nos. 37732, 37728, 37727, 37731, 37730, and 37729, in the order given above.

The above synonymy disagrees slightly with that in the list of species (p. 5) in that the possible varietal status of *striatula* Casey,



with *nanella* Casey as its synonym, as discussed below, is not emphasized. A study of the median lobe from about 35 dissected males and the external examination of about 900 specimens have supplied no useful distinction by which subspecific forms can be identified if they exist in the material discussed below. Prior to Casey's 1920 paper, the damage to tobacco culture in the States bordering Mexico was referable to *mucorea*, but his proposal to distinguish as species six other closely allied forms by what are now believed to be abnormal or insignificant differences rendered all identifications uncertain. The synonymy indicated above is based upon reexamination of LeConte's type and of the Casey types, in comparison with very large series of fresh material; it may need revision if *striatula* Casey or other forms can be reared in pure colony. The writer believes that abnormal individuals, identical with the types of certain of the named forms, can be reared from normal parents, and that the causes of the aberration can be learned, although as yet adequate biological data for this have not been assembled.

Dwarfs appear in all populations, and in this genus these depauperates are usually different in habitus because of abnormally sparse vestiture and rougher sculpture, as well as abnormalities in proportion. Abnormal vestiture, even in individuals of normal size, may contribute a distinctive habitus which, in uniques from remote localities, can be quite deceptive but if occurring among normal samples may be readily discounted. Abnormal vestiture may be due to greater curvature, shorter length, and greater depression or erection of the individual scales, the shape of which may be parallel and truncate apically or narrowly oval, tapering and acuminate at apex. In a series reared from one tobacco stalk, the vestiture varied from white to ochreous throughout; sometimes the discal pronotal scales are white and the marginal ones yellow, but the yellow color is rarely observable in old cabinet specimens and may be fugitive. The short median process between the pair of pubescent marginal notches at the apex of the last visible sternite of the male, called "ligula" by Casey and used by him as a specific character to distinguish *apicata* from *mucorea*, appears to be worthless as a taxonomic character. Careful measurements of its width in proportion to the width of the pygidium in the 11 male types of *striatula*, 8 male types of *apicata*, 2 males labeled "*mucorea*" in the Casey collection, and 5 males reared from a tobacco stalk at Tempe, Ariz., may be recorded decimally as follows:

*striatula* Casey, 0.12, 0.12, 0.13, 0.13, 0.14, 0.14, 0.15, 0.16, 0.16, 0.17, 0.22.

*apicata* Casey, 0.12, 0.14, 0.14, 0.15, 0.15, 0.17, 0.17, 0.22.

*mucorea* (Casey), 0.14, 0.18.

*apicata* ? (reared), 0.14, 0.14, 0.16, 0.18, 0.19.

In the LeConte collection, the 13 examples under the name label "*trinotatus* Say *vestitus* Sch." represent 3 species, as follows:

*trinotatus* Say, specimens nos. 1, 2, 3, 4, and 12.

*compacta* Casey, specimens nos. 6 and 11.

*mucorea* Lec., specimens nos. 5, 7, 8, 9, 10, and 13, the last being the original type.

This type is a subnormal female, measuring 4.6 mm in length, has fine, linear, feebly curved, hairlike scales on the elytra, and moderate, coalescent, propleural maculae. In individual characteristics, it is practically a duplicate of the female type of *arida* Casey, and greatly

resembles dwarfs reared from the rootstalk of tobacco at Tempe, Ariz., in 1925 and 1929, the normal and maximum specimens of which agree with Casey's series of *apicata*.

A series of 17 specimens from Tucson, Ariz., these comprising the type series of *striatula* and *nanella*, display a distinctive habitus, very difficult to analyze, separating them from the great mass of specimens, the normal of which is better represented by the types of *apicata* than by the depauperate individual from which *mucoorea* was described 70 years ago. This small series may represent a brood which matured under abnormal conditions, or a distinct race or species peculiar to some unusual host plant, but without definite evidence these specimens are better left as of possible varietal rank. Apparently better referred to this race than to normal *mucoorea* (= *apicata*) are two male specimens from Florence, Ariz., May 8, 1903 (C. R. Biederman, collector, in Greene collection) and a male from Palmerlee, Huachuca Mountains, June 1902 (Charles Schaeffer).

The habitat of this species or complex of forms seems to have been the Sonoran region, from which it may have spread eastward nearly to Louisiana and southward to below Durango, being represented in material before the writer by localities as shown on the map (fig. 1). A specimen labeled "Mexico City" is believed to be a mislabeled northern sample. Whether tobacco infestations are ascribable to preferred or to fortuitous oviposition by females issuing from *Datura* or from tobacco stalks seems not to have been demonstrated, nor do the data on the material show a spread, or transportation of *mucoorea* by commerce. The joint attack on tobacco at Camargo, Chihuahua, by two species, *mucoorea* and *championi*, suggests interesting possibilities if these two previously isolated but similar species are able to hybridize and modify their host-plant adaptability—this possibility being suggested by the appearance of *mucoorea* characteristics on some of the specimens of *championi* in the sample. It is suggestive to mention here the crossing pair (*texana* male  $\times$  *mucoorea* female) collected on *Datura tatula* under natural field conditions at Willis, Tex., May 18, 1903, by J. C. Bridwell. If assembled host-plant records for *mucoorea* are scanned, the species appears to be a general inhabitant of almost any solanaceous plant. But many of the records are not supported by preserved specimens, and the probability that errors have been made in weevil as well as in host-plant determinations leaves considerable doubt as to some host-plant records and their significance. Results of future field studies may require the readoption of certain of the form names here suppressed.

Such pin-label records as "on corn" and "on cotton" may be discounted, but a field note stating that a weevil was feeding within the top of a corn plant (Wildermuth, April 1910, Holtville, Calif.), although unusual, may be more than accidental. Another record, not supported by specimens before the writer, cites capture of 16 adults assigned to this species, as well as an egg in a puncture, and later a larva, in a shrub called "squaw bush" or "squaw berry," *Lycium* sp. (Caffrey, March–April 1914, Tempe, Ariz.). There are many records of serious or minor injury to tobacco, specimens before the writer being from Tempe, Ariz.; Brownsville, Sequin, and Willis, Tex.; United States Farm, Calif., as well as San Blas, Tepic, and

Triunfo, Baja California, and Camargo, Chihuahua, in Mexico. Many records cite *Datura stramonium*, *D. meteloides*, *D. tatula*, jimsonweed, toloache, etc., some of them referring to adults reared in the stalks. A few specimens of weevils labeled as reared from fruit of eggplant (Morrill, March 1926, or 1927, Cajene, Yaqui Valley, Mexico) are before the writer, as are also series eating potatoes (Parman 1915 and 1917, Uvalde, Tex., and McKinney 1929, Tempe, Ariz.); 1 record on belladonna (Mueller, March 1918, Los Angeles, Calif.); and 1 reared (perhaps an error) from *Solanum eleagnifolium* (Jan. 25, 1909, Brownsville, Tex., in the Chittenden collection). Negative results were obtained by Bridwell at Willis, Tex., in 1903 from repeated field examinations of tomato, several species of *Physalis*, and 5 species of *Solanum* (*torreyi*, *eleagnifolium*, *rostratum*, *nigrum*, and *sisymbriifolium*), but in confinement *mucorea* readily fed upon all of these except the 2 last-named species. *S. carolinense* yielded only 2 specimens of *mucorea* although the weevils were abundant on adjacent *Datura* plants. To these may be added numerous records on specimens recently received from the Tempe, Ariz., laboratory of the Bureau of Entomology and Plant Quarantine (Davis and McKinney), the host plants cited being *Physalis angulata*, *Datura*, tobacco, *Nicotiana trigonophylla* (1 adult), *N. antennata* (2 adults), *N. rustica* (47 reared adults), and potato (78 adults mostly from pupal cells). Still another lot was taken from pupal cells in stems of a large *Physalis* at El Centro, Calif., in January 1911 by J. C. Bridwell.

The three-page account of The Potato Stalk Borer in the Imperial Valley, Calif., published by Essig (6) in 1915, and in condensed form in 1926, as well as the Arizona record of 1915 by Morrill (11), both under the name *Trichobaris trinotata* Say, probably deals with *T. mucorea*, but no specimens are now available for reidentification.

(8) **TRICHOBARIS BRIDWELLI**, new species

(Fig. 2, *H*, and fig. 3, *F*)

*Trichobaris compacta* Bridwell, 1904, U. S. Dept. Agr., Bur. Ent. Bull. 44: 45; Champion, 1909, Biologia Centrali-Americana. Insecta. Coleoptera, v. 4 (pt. 5), p. 413 (in part).

*Type and paratypes*.—United States National Museum catalog no. 50863. Four paratypes returned to H. P. Löding.

Robust, subdepressed, subparallel, very densely clothed with recumbent white scales; ornamented with moderate-sized black spots at scutellum and on bases of thorax and elytra near humerus as well as two small spots on propleura; length about 5 mm, width 2.45 mm.

A series of 180 specimens are from Clemson College, S. C.; Barnesville, Ga.; Mount Vernon and Calvert, Ala.; Baton Rouge, La.; Caruthersville, Mo. (type locality); Ada, Okla.; and Alpine, Llano, Beaumont, Dallas, Tyler, Richmond, Palestine, Calvert, Crockett, Victoria, Willis, and Overton, Tex.

It is very closely allied to *compacta* Casey, under which name it has usually been identified, but it differs conspicuously in having propleural maculation and in the shape of the median lobe. A dwarf male from the type locality is hardly more than half as long as the normal individuals.



The earliest-collected specimens of *bridwelli* are dated July 5, 1902, from seeds of jimsonweed at Willis, Tex., having been then regarded as the tobacco stalk borer (*T. mucorea*). The following year, however, J. C. Bridwell, for whom this species is now named, studied this and other species which he distinguished in that locality and preserved large series of each, together with samples of their work. Several subsequent lots reared from fruit of the same common jimsonweed have been assembled besides others without host-plant record, but a female labeled as from potato at Florence, Miss., May 1914 (W. G. Ellis) suggests that it may become of economic importance. The data are not conclusive, but the species appears to be spreading eastward through the Cotton Belt just as certain other well-known southwestern forms have invaded the South Atlantic States, the most eastern sample being from Clemson College, S. C., May 29, 1931 (O. L. Cartwright). *Datura* pods from Caruthersville, Mo., February–March 1922, yielded living adults which were prepared for the type series. The Durango specimens with propleural maculae mentioned by Champion, 1909, may be referable to this species or may be males of *major*.

(9) *TRICHOBARIS COMPACTA* Casey

(Fig. 2, I, J)

*Trichobaris compacta* Casey, 1892, N. Y. Acad. Sci. Ann. 6: 563, 566; (Cas.)  
Champion, 1909, Biologia Centrali-Americana. Insecta. Coleoptera, v. 4 (pt. 5), p. 413 (in part).

*Trichobaris brevipennis* Casey, 1920, Memoirs on the Coleoptera, v. 9, p. 379.

*Trichobaris retrusa* Casey, 1920, p. 380.

*Trichobaris utensis* Casey, 1920, p. 380.

*Trichobaris densata* Casey, 1920, p. 381.

Type localities of the several specific concepts are indicated on the map (fig. 1), but they require more detailed discussion. The synonymy given above should be held as tentative pending support by biological evidence, and the form treated above as a distinct species (*bridwelli*) is very closely related to this complex. Two of the named forms, *densata* and *brevipennis*, appear to be large and small individuals from southern California and are more likely to prove strictly synonymous than the other 2, which may represent local races or subspecies. The "series of about fifty specimens" from which Casey described *compacta* 28 years earlier has become scattered, and only 17 remained under this name in his collection as it came to the National Museum, but 3 other specimens given to Chittenden by Casey are now recognizable as paratypes of *compacta*, 2 others stand in the LeConte collection apparently placed there by Casey, and others will doubtless be found where they were presented to other collections. As elsewhere stated, LeConte's sixth and eleventh specimens under *trinotata* are *compacta*. As restricted in Casey's present series, and here accepted, the holotype of *compacta* is a male (type U. S. National Museum catalog no. 37738) from San Diego, Calif. (Dunn), and 2 paratypes (nos. 7 and 16) are similarly labeled; 5 paratypes (nos. 2, 3, 5, 8, and 14), as well as 1 of those in the Chittenden collection, came from Colton, Calif. (Wickham); 7 paratypes (nos. 4, 6, 9, 12, 13, 15, and 17) have only the State label "Cal.," the 2 remain

ing paratypes (nos. 10 and 11) are labeled "Ariz." with a red line under the last two letters, the significance of which appears to be unrecorded. From a critical examination of his material it appears that the unique type of *brevipennis* (U. S. National Museum catalog no. 37734) and his 4 specimens of *densata* (U. S. National Museum catalog no. 37736) were paratypes of *compacta* before he assigned the new names to them, but his type of *utensis* (U. S. National Museum catalog no. 37737) from St. George, Utah, and his three types of *retrusa* (U. S. National Museum catalog no. 37735) were added to his collection after 1892. Of the two other paratypes of *compacta*, found in the Chittenden collection, one is from San Diego, Calif., and appears identical with the type set of *densata*, while the other is labeled "Ari." and resembles those left by Casey under the name *compacta*.

Evidence to prove or disprove racial distinctness in habits or host plants would be welcome, but at present the above segregates may be briefly summarized as follows:

*compacta* (restricted). Type locality, San Diego, Calif. Size medium to large, vestiture moderate, gray. Slight differences in shape of discal squamae can be noted, the type and most of the paratypes having scales very narrow, widest at middle and almost acuminate apically, while on the first paratype they are broader, parallel toward apex, and truncate; on two other paratypes (nos. 9 and 12) they are less conspicuously truncate.

*densata* Casey, 1920. Type locality, same as for *compacta*. Size slightly larger, vestiture slightly more conspicuous and ochreous.

*brevipennis* Casey, 1920. Type locality, southern California. Same as *compacta*. One male specimen.

*utensis* Casey, 1920: Type locality, St. George, Utah. Slightly smaller than *compacta*, vestiture gray, more densely placed, and tending to become suberect. Beside the unique male type, another male had later been placed by Casey and two topotypes from the original set have been received in the Wickham collection.

*retrusa* Casey, 1920. Type locality, Tucson, Ariz. Slightly smaller, more elongate, and less densely clothed with gray vestiture than in *compacta*. The type and second paratype are males. Another specimen referable to this form is on the card of duplicates included among the 17 specimens of the type series of *T. mucorea striatula*.

Besides the Casey material listed above, more than 170 individuals in the National collection are placed here, but all attempts to segregate them under the several Caseyan names have failed. Of them about 120 are from southern California, 40 from Arizona, 2 from New Mexico (Mesilla Park and Las Cruces, Cockerell, United States Department of Agriculture note no. 7456), 1 from "V. T.", 7 from San Luis, Sonora, and 3 from Los Mochis, Sinaloa.

Of the 9 lots of specimens bearing host-plant labels, 7 refer to *Datura* (*meteloides*, *discolor*, and spp.) and the other 2 lots are labeled "Bred from Potato" (Morrill, April 1926, Los Mochis, Sinaloa), and "Feeding on Potato Leaves" (Pinkus, May 1913, Bard, Calif.). Three of the lots from *Datura* specify rearing from pods. Two specimens from Tempe, Ariz., are labeled "attacking *Physalis angulata*." The report by Cockerell (4) in 1897 of breeding in stems of *Datura meteloides* should be confirmed.

Specimens from near Tucson, Ariz., and Las Cruces, N. Mex., as well as the few from Utah, are smaller than the average from California, but the differences, even in curvature of the median lobe (fig. 2, *F*, *G*), seem intergradient.

(10) *TRICHOBARIS PELLICEA* (Boheman)

(Fig. 2, K)

*Baridius pelliceus* Boheman, 1844, in Schoenherr, Genera et Species Curculionidum . . . , v. 8 (pt. 1), p. 160.

*Baris pellicea* (Boh.) Gemminger and Harold, 1871, Catalogus Coleopterorum . . . , v. 8, p. 2625.

*Trichobaris pellicea* (Boh.) Champion, 1909, Biologia Centrali-Americana. Insecta. Coleoptera, v. 4 (pt. 5), p. 414 (in part); (Boh.) Casey, 1920, Memoirs on the Coleoptera, v. 9, p. 382.

The type specimen from "Mexico" was sent by Germar to Schoenherr for description prior to 1844, and although that country then included California it is probable that the recorded habitat referred to the vicinity of the City of Mexico and that the so-called "type" labeled "Calif." mentioned by Champion (1909), which was submitted to him by Sjöstedt, is not the original type. The latter may still be in the Germar collection of weevils which in 1926 Horn (9, p. 51) records as in "Mus. Halle." Although very closely related to *texana*, the 14 specimens from near the Federal District of Mexico offer a distinctive habitus, and until more positive evidence is available it is believed unwise to suppress *texana*. The closely related but much smaller form known as *cylindrica* may also prove to be only the result of a distinctive host-plant habit. All three species vary in size and in other characters, but satisfactory intergradation justifying synonymy is not before the writer. The pin labels contribute data as follows: On *Solanum*, Puebla, May 1922 (Smyth); Coapa, Distrito Federal, June (Smyth); Mexico, Distrito Federal (Kraemer, Barrett, Inda); San Angel, Distrito Federal, August (Wickham); Puente de Ixtla, Morelos (Wickham, in Casey collection).

(11) *TRICHOBARIS TEXANA* LeConte

(Fig. 2, L)

*Trichobaris texana* LeConte, 1876, Amer. Phil. Soc. Proc. 15: 288; (Lec.) Casey, 1892, N. Y. Acad. Sci. Ann. 6: 566; (Lec.) Casey, 1920, Memoirs on the Coleoptera, v. 9, p. 382.

*Trichobaris pellicea* Champion, 1909, Biologia Centrali-Americana. Insecta. Coleoptera, v. 4 (pt. 5), p. 414 (in part).

*Trichobaris cylindrica* Champion, 1909, p. 414 (in part?).

*Trichobaris amplicollis* Casey, 1920, Memoirs on the Coleoptera, v. 9, p. 383.

*Trichobaris insolita* Hayes, 1935, Brooklyn Ent. Soc. Bull., v. 30, p. 28 (in part).

In the LeConte collection the supposed type appears to have been relabeled "*Trichobaris texana* LeC." in Casey's handwriting, this label covering the original LeConte label "*Baris texana*." Two other specimens following it are presumed to be paratypes, but the fourth and fifth, labeled "Ari," appear to be large faded specimens of *cylindrica*, placed there after the name was published. The type locality is probably the place where Belfrage lived in Bosque County, Tex., about 40 miles west-northwest of Waco.

The type of *amplicollis* (U. S. National Museum catalog no. 37739) is a female slightly larger and more robust than the 2 females and 5 males under the name *texana* in the Casey collection, but it seems to agree in nearly every respect with the other large females found in the extended series. The originally stated proportional distinctions of pronotum and elytra seem to be of no specific significance.

As mentioned under *pellicea*, *texana* appears to differ in several minor characters. Except for a few subnormal individuals, the speci-



mens of *texana* are larger and more robust. The dorsal vestiture is uniform in color, the scales a little broader, more completely covering the integument, and the suberect hairlike scales in the abdominal concavity of the male appear to be narrower in contrast to the appressed scales on the sides of the sternites. The orificial plates of the aedeagus are broader and less widely separated.

About 180 specimens from localities in Texas, New Mexico, Colorado, Oklahoma, Arkansas, and Kansas, and one from Monterrey, Nuevo Leon, Mexico (as shown on the map, fig. 1), are identified as this species. Some variation in size is obvious, besides a few more conspicuous dwarfs among reared specimens. Two interesting pairs observed on *Solanum rostratum* at Willis, Tex., May 18, 1903, by J. C. Bridwell are in the material. The males are normal, about 5 mm in length, but one of the females is a dwarf, only 3.5 mm long, and the other female is not *texana* but an apparently normal female of *mucorea*. Mr. Bridwell informs the writer that these two pairs were mating under natural conditions on the wild plants.

Most of the 17 lots to which host-plant pin labels are attached cite *Solanum rostratum*, and notes often refer to a stem-boring habit (Mitchell, Sanderson, Hinds, Walker, and Bridwell). One label records rearing from *A. heterodoxum* at Llano, Tex. (Cushman), another cites *S. torreyi* at Dallas, Tex. (Jones), and 4 specimens were extracted from *S. eleagnifolium* at Uvalde, Tex. (Bridwell). Records of doubtful or erroneous nature may also be mentioned: 3 "on cotton"; 1 "on *Marrubium vulgare*", April 1908, Kerrville, Tex. (Pratt); 1 "on *M. puncticollis*" (meaning of *M.* not now understood) at Longmont, Colo. (Titus); 1 "on nettle," Calvert, Tex. (Harris); 1 hibernating in stem of *Xanthium*, Victoria, Tex. (Mitchell). Less acceptable are the following pin-label records: 1 reared from *Datura* seed (!), Willis, Tex.; 1 on *Datura* at Mesilla, N. Mex. (Cockerell); a series of more than 50 specimens on *Achillea lanulosa*, Ardmore, Okla., May 1905 (Jones). Some of these may indicate temporary resting places during dispersal flight, while others may be unfortunate but inevitable preparator's errors in remounting fallen specimens or be due to a misreading of field-note numbers. One of the five specimens recorded by Hayes (1935) as *T. insolita* is a female of *texana* and is labeled "Sam. G. Kelly Coll., Manhattan, Kansas, reared from *Physalis*", but verification of such hitherto unknown breeding habit would appear desirable.

#### (12) TRICHOBARIS CYLINDRICA Casey

(Fig. 2, M)

*Trichobaris cylindrica* Casey, 1892, N. Y. Acad. Sci. Ann. 6: 567.

In addition to the type series of 8 specimens (U. S. National Museum catalog no. 37740) the National collection contains 7 specimens from Arizona (Morrison); 7 from Tempe, Ariz., July-August, on "silver-leaf horse-nettle" (E. G. Davis); 12 extracted in January 1929 from pupal cells in *Solanum eleagnifolium* at Tempe, Ariz. (McKinney); and 2 from Las Cruces and Mesilla, N. Mex. (Cockerell). In the LeConte collection the fourth and fifth specimens under the name *texana* are labeled "Ari." and seem to be this form although somewhat larger than usual.

This form may be only a subspecies of *texana*, which may again merge with *pellicea*, but until better evidence is assembled their union is not justified. *T. cylindrica* is a very small, strongly ochreous form (perhaps fading with long exposure) of the northern Sonoran region. The single specimen doubtfully referred to this species by Champion (1909) is within the habitat of *texana*, under which it is tentatively cited.

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